INTERNATIONAL JOURNAL OF RADIATION ONCOLOGY BIOLOGY•PHYSICS

Volume 24, 1992

List of Contents/Author Index/Subject Index

PERGAMON PRESS

NEW YORK OXFORD SEOUL TOKYO

Pergamon Press Offices:

U.S.A.: Pergamon Press, 660 White Plains Road, Tarrytown, New York 10591-5153, U.S.A., INTERNET "PPI@PERGAMON.COM"

U.K.: Pergamon Press, Headington Hill Hall, Oxford, OX3 0BW, England

KOREA: Pergamon Press, K.P.O. Box 315, Seoul 110-603, Korea

JAPAN: Pergamon Press, Tsunashima Building Annex, 3-20-12 Yshima, Bunkyo-ku, Tokyo 113, Japan

---

Editorial Office: Division of Radiation Oncology, Strong Memorial Hospital, 601 Elmwood Avenue, Rochester, NY 14642, U.S.A., (716) 275-5175.

Publishing, Subscription and Advertising Offices: Pergamon Press Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A., INTERNET "PPI@PERGAMON.COM"; and Pergamon Press Ltd., Headington Hill Hall, Oxford OX3 0BW, England.

Published 15 per annum (vols. 25–27). *Annual Institutional Subscription Rate* (1993): US $1,425.00 (£770.00). *Personal Subscription Rate* for those whose library subscribes at the regular rate (1993): US $258.00 (£136.00). US dollar prices are definitive. Sterling prices are quoted for convenience only, and are subject to exchange rate fluctuation. Prices include postage and insurance and are subject to change without notice.

Reprints of all articles are available from Pergamon Press in lots of 50, minimum order 100 copies. Call for details.

Copyright © 1992 Pergamon Press Ltd.

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Photocopying information for users in the U.S.A. The Item-Fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying, beyond that permitted by Section 107 or 108 of the United States Copyright Law, is paid. The appropriate remittance of $5.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970.

Permission for other use. The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for copying. Please contact the Subsidiary Rights Manager, Publishing Services Dept. at either Pergamon Press Ltd. or Pergamon Press Inc.

The Item-Fee Code for this publication is: 0360–3016/92 $5.00 + .00.

While every effort is made by the publishers and editorial board to see that no inaccurate or misleading data, opinion or statement appears in this journal, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Accordingly, the publishers, the editorial board and editors and their respective employees, officers and agents accept no responsibility of liability whatsoever for the consequences of any such inaccurate or misleading data, opinions or statement.

Drug and dosage selection: The authors have made every effort to ensure the accuracy of the information herein, particularly with regard to drug selection and dose. However, appropriate information sources should be consulted, especially for new or unfamiliar drugs or procedures. It is the responsibility of every practitioner to evaluate the appropriateness of a particular opinion in the context of actual clinical situations and with due consideration to new developments.

U.S. COPYRIGHT LAW APPLICABLE TO USERS IN THE U.S.A.

Disclaimer–The American Society for Therapeutic Radiology and Oncology assumes no responsibility for the accuracy of any editorial material contained in this Journal, and such editorial material does not represent official policy or recommendations of the Society. The appearance of advertising in this Journal does not constitute a guarantee or endorsement by the Society of the quality or value of any advertised products or services or of the claims made for them by the advertisers.

INTERNATIONAL JOURNAL OF RADIATION ONCOLOGY, BIOLOGY, PHYSICS (ISSN 0360–3016) is published 15 per annum by Pergamon Press. Second-class postage paid at Tarrytown, NY and Pergamon Press. Postmaster: send address changes to **Int'l J. Radiation Oncology, Biology, Physics,** Pergamon Press, Inc., 660 White Plains Rd., Tarrytown, NY 10591-5153. Address correction requested.

Printed in the United States of America.

INTERNATIONAL JOURNAL OF
RADIATION ONCOLOGY
BIOLOGY·PHYSICS

VOLUME 24, NUMBER 1, 1992

TABLE OF CONTENTS

Editor's Note
P. Rubin 1

● *CLINICAL ORIGINAL CONTRIBUTIONS*

Radiation Therapy in the Management of Medically Inoperable Carcinoma of the Lung: Results and Implications for Future Treatment Strategies
D. E. Dosoretz, M. J. Katin, P. H. Blitzer, J. H. Rubenstein, S. Salenius, M. Rashid, R. A. Dosani, G. Mestas, A. D. Siegel, T. T. Chadha, T. Chandrahasa, S. E. Hannan, S. B. Bhat and M. P. Metke 3

Radiotherapy Versus Radiotherapy Enhanced by Cisplatin in Stage III Non-Small Cell Lung Cancer
M. G. Trovó, E. Minatel, G. Franchin, M. G. Boccieri, O. Nascimben, G. Bolzicco, G. Pizzi, A. Torretta, A. Veronesi, C. Gobitti, D. J. Zanelli and S. Monfardini 11

Combined Modality Therapy for Stage III Non-Small Cell Lung Carcinoma: Results of Treatment and Patterns of Failure
S. Reddy, M. S. Lee, P. Bonomi, S. G. Taylor, IV, E. Kaplan, M. Gale, L. P. Faber, W. Warren, C. F. Kittle and F. R. Hendrickson 17

Should Patients With Post-Resection Locoregional Recurrence of Lung Cancer Receive Aggressive Therapy?
W. J. Curran, Jr., S. H. Herbert, P. M. Stafford, H. M. Sandler, S. A. Rosenthal, W. G. McKenna, E. Hughes, M. J. Dougherty and S. Keller 25

Observations on the Predictive Value of Perfusion Lung Scans on Post-Irradiation Pulmonary Function Among 210 Patients With Bronchogenic Carcinoma
W. J. Curran, Jr., P. J. Moldofsky and L. J. Solin 31

Adverse Influence of Younger Age on Outcome in Patients With Non-Small Cell Lung Carcinoma (NSCLC) Treated With Radiation Therapy (RT) Alone
S. H. Herbert, W. J. Curran, Jr., S. A. Rosenthal, P. M. Stafford, W. G. McKenna, E. N. Hughes and H. M. Sandler 37

A Reappraisal of the Role of Prophylactic Cranial Irradiation in Limited Small Cell Lung Cancer
M. Rosenstein, J. Armstrong, M. Kris, B. Shank, H. Scher, D. Fass, L. Harrison, Z. Fuks and S. Leibel 43

Long-Term Neuropsychologic Sequelae of Childhood Leukemia: Comparison of Two CNS Prophylactic Regimens
J. Giralt, J. J. Ortega, T. Olive, R. Verges, I. Forio and L. Salvador 49

Supratentorial Malignant Glioma: Patterns of Recurrence and Implications for External Beam Local Treatment
L. E. Gaspar, B. J. Fisher, D. R. Macdonald, D. V. LeBer, E. C. Halperin, S. C. Schold, Jr. and J. G. Cairncross 55

Second Head and Neck Cancers Following Radiation Therapy of T_1 and T_2 Cancers of the Oral Cavity and Oropharynx
J. Fijuth, J.-J. Mazeron, C. Le Péchoux, P. Piedbois, M. Martin, E. Haddad, E. Calitchi, B. Pierquin, J.-P. Le Bourgeois 59

Seventeen Years Experience With Accelerated Radiotherapy for Carcinoma of the Breast
V. H. Svoboda, J. Krawczyk and A. Krawczyk 65

Extramammary Paget's Disease of the Perineal Skin: Role of Radiotherapy
P. Besa, T. A. Rich, L. Delclos, C. L. Edwards, D. M. Ota and J. T. Wharton 73

● *PHASE I/II CLINICAL TRIALS*

M4 Protocol for Cerebellar Medulloblastoma: Supratentorial Radiotherapy May Not Be Avoided
E. Bouffet, J. L. Bernard, D. Frappaz, J. C. Gentet, H. Roche, P. Tron, C. Carrie, C. Raybaud, A. Joannard, C. Lapras, M. Choux, M. Carton, L. Aimard, T. Philip and M. Brunat-Mentigny 79

Tumor Cell Kinetics, Local Tumor Control, and Accelerated Radiotherapy: A Preliminary Report
C. A. Lochrin, G. D. Wilson, N. J. McNally, S. Dische and M. I. Saunders 87

● *BIOLOGY ORIGINAL CONTRIBUTIONS*

Molecular Biology Mechanisms in the Radiation Induction of Pulmonary Injury Syndromes: Interrelationship Between the Alveolar Macrophage and the Septal Fibroblast
P. Rubin, J. Finkelstein and D. Shapiro 93

The Radiation Dose-Response Relationship in a Human Glioma Xenograft and an Evaluation of the Influence of Glutathione Depletion by Buthionine Sulfoximine
E. C. Halperin, D. M. Brizel, G. Honore, M. R. Sontag, O. W. Griffith, D. D. Bigner and H. S. Friedman 103

Quantitative Comparison of Radiolabeled Antibody Therapy and External Beam Radiotherapy in the Treatment of Human Glioma Xenografts
J. A. Williams, J. A. Edwards and L. E. Dillehay 111

Radioresponsiveness, Sublethal Damage Repair and Stem Cell Rate in Spheroids From Three Human Tumor Lines: Comparison With Xenograft Data
M. Stuschke, V. Budach, W. Budach, H.-J. Feldmann and H. Sack 119

Comparisons of the Efficacy of ^{186}Re- and ^{131}I-Labeled Antibody in Multicell Spheroids
V. K. Langmuir, H. L. Mendonca, J.-L. Vanderheyden and F.-M. Su 127

The Influence of Neonatal Thymectomy on the Development of Radiation Myelopathy in Rats
D. De Ruysscher, W. Landuyt, M. Waer, M. Vandeputte and E. van der Schueren 133

● *HYPERTHERMIA ORIGINAL CONTRIBUTIONS*

A Reliable Method for Quantitating Chromatin Fragments by Flow Cytometry to Predict the Effect of Total Body Irradiation and Hyperthermia on Mice
R.-N. Shen, W. N. Crabtree, B. Wu, P. Young, G. A. Sandison, N. B. Hornback and H. Shidnia 139

Combined Hyperthermia and Irradiation in the Treatment of Superficial Tumors: Results of a Prospective Randomized Trial of Hyperthermia Fractionation (1/wk vs 2/wk)
B. Emami, R. J. Myerson, H. Cardenes, K. G. Paris, C. A. Perez, W. Straube, L. Leybovich, M. Mildenberger, R. R. Kuske, V. R. Devineni and N. Kucik 145

● *BRIEF COMMUNICATIONS*

Treatment of Seminoma Arising in Cryptorchid Testes
M. D. Gauwitz and G. K. Zagars 153

Dysgerminoma of the Ovary: Good Prognosis Even in Advanced Stages
M. S. Zaghloul and T. Y. Khattab 161

● *TECHNICAL INNOVATIONS AND NOTES*

A New Re-Entrant Ionization Chamber for the Calibration of Iridium-192 High Dose Rate Sources
S. J. Goetsch, F. H. Attix, L. A. DeWerd and B. R. Thomadsen 167

The Effect on Dose of Kilovoltage X-Rays Backscattered from Lead
M. S. Huq, N. Venkataramanan and J. A. Meli 171

● *SPECIAL FEATURES*

Portal Radiography Practice in Canada
P. Dunscombe and K. Fox 177

● *EDITORIALS*

Can Lung Cancer be Cured by Irradiation Alone?
B. G. Haffty 181

Radiation Tolerance and the New Biology: Growth Factor Involvement in Radiation Injury to the Lung
Z. Fuks and R. Weichselbaum 183

Is Concomitant Cisplatin and Radiotherapy More Efficacious Treatment than Radiotherapy Alone in Stage III Non-Small Cell Lung Cancer?
R. Komaki 185

● *CORRESPONDENCE*

Re: Editorial by Dr. Deutsch
R. Sauer 187

Prophylactic Cranial Irradiation for Lung Cancer Patients
J. F. Minne and J. Bonneterre 187

Response to Drs. Minne and Bonneterre
A. H. Russell 187

Combined Modality Treatment for Locally Recurrent Rectal Cancer
K. Sommer, W. P. Brockmann, T. Wiegel and K. H. Hübener 187

Response to Dr. Sommer et al.
C. S. Wong and B. J. Cummings 188

Alpha, Beta, and Surviving Fraction
J. F. Fowler 188

● *MEETINGS* 191

● *ERRATUM* 193

VOLUME 24, NUMBER 2, 1992

TABLE OF CONTENTS

Editor's Note 195

● *CLINICAL ORIGINAL CONTRIBUTIONS*

Distant Metastases After Irradiation Alone in Carcinoma of the Uterine Cervix
H. Fagundes, C. A. Perez, P. W. Grigsby and M. A. Lockett 197

Stage IB or IIA-B Carcinoma of the Intact Uterine Cervix Treated With Irradiation: A Multivariate Analysis
G. C. Lowrey, W. M. Mendenhall and R. R. Million 205

FIGO Stage IIIA Carcinoma of the Uterine Cervix
V. S. Kavadi and P. J. Eifel 211

Predictive Role of TDF Values in Late Rectal Recto-Sigmoid Complications in Irradiation Treatment of Cervix Cancer
S. M. Deore, P. S. Viswanathan, S. K. Shrivastava, S. J. Supe and K. A. Dinshaw 217

Endometrial Cancer With Para-Aortic Adenopathy: Patterns of Failure and Opportunities for Cure
B. W. Corn, R. M. Lanciano, K. M. Greven, D. J. Schultz, S. A. Reisinger, P. M. Stafford and G. E. Hanks 223

Radiation Therapy for Surgically Proven Para-Aortic Node Metastasis in Endometrial Carcinoma
P. G. Rose, S. D. Cha, W. K. Tak, T. Fitzgerald, F. Reale and R. E. Hunter 229

Intracavitary Brachytherapy Combined With External-Beam Irradiation for Squamous Cell Carcinoma of the Thoracic Esophagus
M. Hareyama, M. Nishio, Y. Kagami, N. Narimatsu, A. Saito and T. Sakurai 235

Radiotherapy for Locoregional Relapses of Rectal Carcinoma After Initial Radical Surgery: Definite but Limited Influence on Relapse-Free Survival and Survival
M. L. M. Lybeert, H. Martijn, W. de Neve, M. A. Crommelin and J. G. Ribot 241

Episcleral Plaque Radiotherapy in the Treatment of Uveal Melanomas
Z. Petrovich, G. Luxton, B. Langholz, M. A. Astrahan and P. E. Liggett 247

Breast Conservation: Long-Term Australian Data
J. Boyages, C. Bosch, A. O. Langlands, A. M. Bilous, B. Barraclough and V. J. Gebski 253

● *HYPERTHERMIA ORIGINAL CONTRIBUTIONS*

Thermoradiotherapy for Residual Microscopic Cancer: Elective or Post-Excisional Hyperthermia and Radiation Therapy in the Management of Local-Regional Recurrent Breast Cancer
D. S. Kapp, R. S. Cox, T. A. Barnett and R. Ben-Yosef 261

● *BIOLOGY ORIGINAL CONTRIBUTIONS*

The Prediction of Human Tumor Radiosensitivity *In Situ:* An Approach Using Chromosome Aberrations Detected by Fluorescence *In Situ* Hybridization
J. M. Brown, J. Evans and M. S. Kovacs 279

Radiosensitivity Measurement of Keratinocytes and Fibroblasts From Radiotherapy Patients
F. B. Geara, L. J. Peters, K. K. Ang, J. L. Wike and W. A. Brock 287

Reoxygenation in the RIF-1 Tumor After Chemotherapy
M. J. Dorie and R. F. Kallman 295

● *BRIEF COMMUNICATIONS*

Radiation Therapy of Spinal Cord Compression Caused by Breast Cancer: Report of a Prospective Trial
E. Maranzano, P. Latini, F. Checcaglini, E. Perrucci, C. Aristei, B. M. Panizza and S. Ricci 301

Reirradiation of Pituitary Adenoma
R. Schoenthaler, N. W. Albright, W. M. Wara, T. L. Phillips, C. B. Wilson and D. A. Larson 307

β Irradiation of Recurrent Ptergia: Results and Complications
K. E. Dusenbery, I. H. Alul, E. J. Holland, F. M. Khan and S. H. Levitt 315

● *TECHNICAL INNOVATIONS AND NOTES*

Source Configuration and Dose Rates for the Selectron Afterloading Equipment for Gynecologic Applicators
P. W. Grigsby, J. F. Williamson and C. A. Perez 321

Three-Dimensional Tumor Dosimetry for Radioimmunotherapy Using Serial Autoradiography
P. L. Roberson, D. J. Buchsbaum, D. B. Heidorn and R. K. Ten Haken 329

● *ONCOLOGY INTELLIGENCE*

High Dose Rate Intracavitary Brachytherapy for Carcinoma of the Cervix: The Madison System: I. Clinical and Radiobiological Considerations
J. A. Stitt, J. F. Fowler, B. R. Thomadsen, D. A. Buchler, B. P. Paliwal and T. J. Kinsella 335

High Dose Rate Intracavitary Brachytherapy for Carcinoma of the Cervix: The Madison System: II. Procedural and Physical Considerations
B. R. Thomadsen, S. Shahabi, J. A. Stitt, D. A. Buchler, J. F. Fowler, B. R. Paliwal and T. J. Kinsella 349

● *SPECIAL FEATURES*

A Survey of Prevention and Treatment Regimens for Oral Sequelae Resulting from Head and Neck Radiotherapy Used in Dutch Radiotherapy Institutes
J. Jansma, A. Vissink, J. Bouma, A. Vermey, A. K. Panders and E. J. 's-Gravenmade 359

An Electronic Medical Record System With Direct Data-Entry and Research Capabilities
S. A. Salenius, L. Margolese-Malin, J. E. Tepper, J. Rosenman, M. Varia and L. Hodge 369

● *EDITORIALS*

Is Local Failure a Cause of or a Marker for Metastatic Dissemination in Carcinoma of the Uterine Cervix?
S. A. Leibel and Z. Fuks 377

Adjuvant Hyperthermia for Recurrent Breast Cancer
J. R. Oleson 381

High-Dose-Rate Brachytherapy for Carcinoma of the Cervix: High Tech or High Risk?
P. J. Eifel 383

● *CORRESPONDENCE*

Response to Drs. Leibel and Fuks
H. Fagundes and C. A. Perez 387

HDR vs LDR for Ca Cervix: High Risk or Biased Reporting?
C. G. Orton 387

● *RAPID COMMUNICATIONS*

Groin Dissection Versus Groin Radiation in Carcinoma of the Vulva: A Gynecologic Oncology Group Study
F. B. Stehman, B. N. Bundy, G. Thomas, M. Varia, T. Okagaki, J. Roberts, J. Bell and P. B. Heller 389

● *MEETINGS* 397

VOLUME 24, NUMBER 3, 1992

TABLE OF CONTENTS

Editor's Note
P. Rubin 401

● *CLINICAL ORIGINAL CONTRIBUTIONS*

The Clinical Significance of a Positive Post-Irradiation Prostatic Biopsy without Metastases
B. R. Prestidge, I. Kaplan, R. S. Cox and M. A. Bagshaw 403

The Significance of Post-Irradiation Prostate Biopsy with Long-Term Follow-Up
D. A. Kuban, A. M. El-Mahdi and P. Schellhammer 409

External Beam Radiotherapy for Incidental Adenocarcinoma of the Prostate Discovered at Transurethral Resection
I. D. Kaplan, M. A. Bagshaw, C. A. Cox and R. S. Cox 415

Prognostic Significance of Pelvic Recurrence and Distant Metastasis in Prostate Carcinoma following Definitive Radiotherapy
P. P. Lai, C. A. Perez and M. A. Lockett 423

Nuclear Roundness Factor and Local Failure from Definitive Radiation Therapy for Prostatic Carcinoma
J. Shaeffer, J. A. Tegeler, D. A. Kuban, C. B. Philput and A. M. El-Mahdi 431

Radiotherapy for Prostate Cancer: Should the Seminal Vesicles Be Considered Target?
L. B. Marks and M. S. Anscher 435

The Prognostic Significance of Race and Survival from Prostate Cancer Based on Patients Irradiated on Radiation Therapy Oncology Group Protocols (1976–1985)
M. Roach, III, J. Krall, J. W. Keller, C. A. Perez, W. T. Sause, R. L. S. Doggett, M. Rotman, H. Russ, M. V. Pilepich, S. O. Asbell and W. Shipley 441

High Grade Adenocarcinoma of Prostate in Smokers of Ethnic Minority Groups and Caribbean Island Immigrants
F. Hussain, H. Aziz, R. Macchia, M. Avitable and M. Rotman 451

Combined Pre- and Postoperative Adjuvant Radiation Therapy for Bladder Cancer—A Ten Year Experience
S. A. Reisinger, M. Mohiuddin and S. G. Mulholland 463

Interstitial Iridium-192 for Bladder Cancer (A Multicentric Survey: 205 Patients)
R. Rozan, E. Albuisson, D. Donnarieix, B. Giraud, J.-J. Mazeron, J.-P. Gerard, M. Pernot, A. Gerbaulet, F. Baillet, J. Douchez and T. D. Nguyen 469

Iridium-192 Interstitial Therapy for Squamous Cell Carcinoma of the Penis
M. Delannes, B. Malavaud, J. Douchez, J. Bonnet and N. J. Daly 479

● *PHASE I/II CLINICAL TRIALS*

Conformal Static Field Radiation Therapy Treatment of Early Prostate Cancer Versus Non-Conformal Techniques: A Reduction in Acute Morbidity
E. M. Soffen, G. E. Hanks, M. A. Hunt and B. E. Epstein 485

Phase I/II Study of External Radio Frequency Phased Array Hyperthermia and External Beam Radiotherapy in the Treatment of Prostate Cancer: Technique and Results of Intraprostatic Temperature Measurements
M. S. Anscher, T. V. Samulski, K. A. Leopold and J. R. Oleson 489

Accelerated Fractionation Radiotherapy for Laryngeal Cancer, Acute, and Late Toxicity
J. H. A. M. Kaanders, W. A. J. van Daal, W. J. Hoogenraad and A. J. van der Kogel 497

● *BIOLOGY ORIGINAL CONTRIBUTIONS*

Radiation Tolerance and Fractionation Sensitivity of the Developing Rat Cervical Spinal Cord
A. C. C. Ruifrok, B. J. Kleiboer and A. J. van der Kogel 505

The Hybrid Spheroid Clonogenic Assay for the Intrinsic Radio- and Chemo-Sensitivities of Human Tumors
C. S. Lange, B. Djordjevic and W. A. Brock 511

Heterogeneity of 5-Fluorouracil Radiosensitivity Modulation in Cultured Mammalian Cell Lines
S. R. Smalley, B. F. Kimler, R. G. Evans and W. C. Dalziel 519

Cellular Glutathione (GSH) and Glutathione S-Transferase (GST) Activity in Human Ovarian Tumor Biopsies following Exposure to Alkylating Agents
R. A. Britten, J. A. Green and H. M. Warenius 527

Radiosensitivity of Mouse Skin Epithelial Cell Line Established in Serum-Free Culture: An Alternative to Animal Use
H. Maezawa, K.-H. Wong and M. Urano 533

● *HYPERTHERMIA ORIGINAL CONTRIBUTIONS*

Changes in Heat and Radiation Sensitivity During Long Duration, Moderate Hyperthermia in HeLa S3 Cells
M. A. Mackey, S. L. Anolik and J. L. Roti Roti 543

● *BRIEF COMMUNICATIONS*

High Dose Rate Brachytherapy in Patients with Local Recurrences after Radiotherapy of Non-Small Cell Lung Cancer
G. Sutedja, G. Baris, C. Schaake-Koning and N. van Zandwijk 551

● *TECHNICAL INNOVATIONS AND NOTES*

Ultrasonically Guided Transperineal Seed Implantation of the Prostate: Modification of the Technique and Qualitative Assessment of Implants
A. van't Riet, H. J. te Loo, A. F. G. V. M. Ypma, A. C. A. Mak, F. H. S. van Slooten, C. J. M. Hoekstra and M. C. Stenfert Kroese 555

Quality Assurance for Intraoperative Electron Radiotherapy Clinical Trials: Ionization Chamber and Mailable Thermoluminescent Dosimeter Results
J. D. Hazle, J. C. H. Chu and P. Kennedy 559

● *ONCOLOGY INTELLIGENCE*

Gene Therapy Targeted by Ionizing Radiation
R. R. Weichselbaum, D. E. Hallahan, V. P. Sukhatme and D. W. Kufe 565

● *EDITORIALS*

The Earlier the Better or Unnecessary Therapy?
D. A. Kuban and A. M. El-Mahdi 569

Post Treatment Biopsies of the Prostate: A Stalking Horse for Improving Local Control
G. E. Hanks 571

● *CORRESPONDENCE*

Response to Dr. Oleson
D. S. Kapp 573

Radiotherapy versus Radiotherapy Enhanced by Cisplatin in Stage III Non-Small Cell Lung Cancer
M. G. Trovò, G. D. Zanelli, E. Minatel, G. Franchin and C. Gobitti 573

High-Dose-Rate Brachytherapy for Cervical Carcinoma
J. A. Stitt, B. R. Thomadsen and J. F. Fowler 574

● *MEETINGS* 575

● *ERRATUM* 579

VOLUME 24, NUMBER 4, 1992

TABLE OF CONTENTS

Editor's Note
P. Rubin 581

● *CLINICAL ORIGINAL CONTRIBUTIONS*

High Activity Iodine-125 Interstitial Implant for Gliomas
C. O. Scharfen, P. K. Sneed, W. M. Wara, D. A. Larson, T. L. Phillips, M. D. Prados, K. A. Weaver, M. Malec, P. Acord, K. R. Lamborn, S. A. Lamb, B. Ham and P. H. Gutin 583

Interstitial Brachytherapy for Newly Diagnosed Patients with Malignant Gliomas: The UCSF Experience
M. D. Prados, P. H. Gutin, T. L. Phillips, W. M. Wara, P. K. Sneed, D. A. Larson, S. A. Lamb, B. Ham, M. K. Malec and C. B. Wilson 593

Hyperfractionated Radiation Therapy for Gliomas of the Brainstem in Children and in Adults
D. C. Shrieve, W. M. Wara, M. S. B. Edwards, P. K. Sneed, M. D. Prados, P. H. Cogen, D. A. Larson and V. A. Levin 599

Pediatric Craniopharyngiomas: Long Term Results of Combined Treatment with Surgery and Radiation
W. F. Regine and S. Kramer 611

Defining the Role of Radiosurgery in the Management of Brain Metastases
M. P. Mehta, J. M. Rozental, A. B. Levin, T. R. Mackie, S. S. Kubsad, M. A. Gehring and T. J. Kinsella 619

The Role of Laminectomy in the Combined Treatment of Metastatic Spinal Cord Compression
C. Landmann, R. Hünig and O. Gratzl 627

Patterns of Failure following Combined Modality Therapy for Esophageal Cancer, 1984–1990
B. Kavanagh, M. Anscher, K. Leopold, M. Deutsch, E. Gaydica, R. Dodge, K. Allen, D. Allen, E. W. Staub, G. Montana, J. Crawford and W. Wolfe 633

Multimodality Treatment Programs for Malignant Pleural Mesothelioma Using High-Dose Hemithorax Irradiation
K. Mattson, L. R. Holsti, L. Tammilehto, P. Maasilta, S. Pyrhönen, M. Mäntylä, M. Kajanti, U.-S. Salminen, J. Rautonen and L. Kivisaari 643

Sarcoma Therapy: Functional Outcome and Relationship to Treatment Parameters
K. Karasek, L. S. Constine and R. Rosier 651

● *HYPERTHERMIA ORIGINAL CONTRIBUTIONS*

Treatment of Malignant Gliomas with Interstitial Irradiation and Hyperthermia
B. Stea, J. Kittelson, J. R. Cassady, A. Hamilton, N. Guthkelch, B. Lulu, E. Obbens, K. Rossman, W. Shapiro, A. Shetter and T. Cetas 657

Hyperthermia Enhances Mitoxantrone Cytotoxicity on Human Breast Carcinoma and Sarcoma Xenografts in Nude Mice
G. Wiedemann, O. Mella, S. Roszinski, C. Weiss and Th. Wagner 669

● *BIOLOGY ORIGINAL CONTRIBUTIONS*

Radiosensitivity Testing of Human Malignant Gliomas
J. Ramsay, R. Ward and N. M. Bleehen 675

The Effect of Hyperfractionation on Spinal Cord Response to Radiation
R. S. Lavey, A. K. Johnstone, J. M. G. Taylor and W. H. McBride 681

The Isoquinoline Sulfonamide H7 Attenuates Radiation-Mediated Protein Kinase C Activation and Delays the Onset of X-Ray-Induced G2 Arrest
D. E. Hallahan, S. Virudachalam, D. Grdina and R. R. Weichselbaum 687

The Relationship between Apoptosis and Atrophy in the Irradiated Lacrimal Gland
M. J. Gazda, T. E. Schultheiss, L. C. Stephens, K. K. Ang and L. J. Peters 693

Sensitization Processes in Human Tumor Cells during Protracted Irradiation: Possible Exploitation in the Clinic
J. R. Williams, Y.-G. Zhang and L. E. Dillehay 699

Immunophenotype Predicts Radiation Resistance in T-Lineage Acute Lymphoblastic Leukemia and T-Lineage Non-Hodgkin's Lymphoma
F. M. Uckun, C. W. Song, M. Nesbit, J. H. Kersey and N. K. C. Ramsay 705

Differential Radioprotection of Cultured Human Diploid Fibroblasts and Fibrosarcoma Cells by WR1065
X. Zhang, P. P. Lai and Y. C. Taylor 713

Time Dependent Changes in Myocardial Norepinephrine Concentration and Adrenergic Receptor Density Following X-Irradiation of the Rat Heart
N. A. P. Franken, A. van der Laarse, F. J. Bosker, I. W. C. Reynart, F. J. M. van Ravels, E. Strootman and J. Wondergem 721

● *PHASE I/II CLINICAL TRIALS*

Intraoperative and External Radiotherapy in Resected Gastric Cancer: Updated Report of a Phase II Trial
F. A. Calvo, J. J. Aristu, I. Azinovic, O. Abuchaibe, L. Escude, R. Martinez, E. Tangco, J. L. Hernandez, F. Pardo and J. Alvarez-Cienfuegos 729

● *BRIEF COMMUNICATIONS*

The Frequency of Translocations after Treatment for Hodgkin's Disease
L. M. Smith, J. W. Evans, M. Mori and J. M. Brown 737

Adjuvant Radiotherapy in High Stage Transitional Cell Carcinoma of the Renal Pelvis and Ureter
S. C. Cozad, S. R. Smalley, M. Austenfeld, M. Noble, S. Jennings and R. Reymond 743

The Importance of Brachytherapy Technique in the Management of Primary Carcinoma of the Vagina
R. G. Stock, B. Mychalczak, J. G. Armstrong, J. P. Curtin and L. B. Harrison 747

Preliminary Results in Heavy Charged Particle Irradiation of Bone Sarcoma
V. Uhl, J. R. Castro, K. Knopf, T. L. Phillips, J. M. Collier, P. L. Petti and I. Daftari 755

Hypofractionated Accelerated Radiotherapy in Osteogenic Sarcoma
F. Lombardi, L. Gandola, F. Fossati-Bellani, M. C. Gianni, L. Rottoli and M. Gasparini 761

● *TECHNICAL INNOVATIONS AND NOTES*

The Clinical Utility of Magnetic Resonance Imaging in 3-Dimensional Treatment Planning of Brain Neoplasms
A. F. Thornton, Jr., H. M. Sandler, R. K. Ten Haken, D. L. McShan, B. A. Fraass, M. L. LaVigne and B. R. Yanke 767

Radiosurgery Target Point Alignment Errors Detected with Portal Film Verification
C. F. Serago, A. A. Lewin, P. V. Houdek, S. Gonzalez-Arias, J. G. Schwade, A. Abitbol and V. Marcial-Vega 777

Computer Systems and Mechanical Tools for Stereotactically Guided Conformation Therapy with Linear Accelerators
W. Schlegel, O. Pastyr, T. Bortfeld, G. Becker, L. Schad, G. Gademann, and W. J. Lorenz 781

Three-Dimensional Dose Distribution of Total Body Irradiation by a Duel Source Total Body Irradiator
C. H. Obcemea, R. K. Rice, B. J. Mijnheer, R. L. Siddon, N. J. Tarbell, P. Mauch and L. M. Chin 789

Dose Determination in High Dose-Rate Brachytherapy
P. V. Houdek, J. G. Schwade, X. Wu, V. Pisciotta, J. A. Fiedler, C. F. Serago, A. M. Markoe, A. A. Abitbol, A. A. Lewin, P. G. Braunschweiger and M. D. Sklar 795

● *EDITORIAL*

Hyperthermia and Brachytherapy for Glioma—Will Cooler Heads Prevail?
L. E. Gaspar and J. G. Cairncross 803

● *CORRESPONDENCE*

Block Mounting Solvents
R. J. Barish 805

External Radiation Therapy Versus Prostatectomy
G. L. Shultz and K. Shultz 805

Oxygen Enhancement Ratio of a Murine Fibrosarcoma
H.-P. Beck-Bornholdt and H.-H. Dubben 805

Response to Drs. Beck-Bornholdt and Dubben
Y. Abe and M. Urano 806

Uneasy Rests the Head that Wears the Template
B. Stea, J. R. Cassady and T. C. Cetas 806

● *MEETINGS* 809

VOLUME 24, NUMBER 5, 1992

TABLE OF CONTENTS

● *INTERNATIONAL ESSENTIAL AND GUIDELINES IN RESIDENCY TRAINING*

Introduction
P. Rubin and S. Leibel 811

The European Core Curriculum on Radiotherapy
J. W. H. Leer, J. Overgaard and G. Heeren 813

Special Requirements for Residency Training in Radiation Oncology
J. Marks, J. S. Armbruster, L. W. Brady, R. G. Parker and G. E. Hanks 815

Education in Radiation Oncology in Europe
J. W. H. Leer, J. Davelaar, J. Overgaard and G. Heeren 819

Training in Radiation Oncology in the United Kingdom
R. G. B. Evans 825

Principles of Radiation Oncology Training and Manpower Requirements in Canada
B. J. Cummings 833

Training in Radiotherapy in The Netherlands
J. W. H. Leer and E. M. Noordijk 837

Swedish Requirements for Residency Training in Oncology
B. Nordenskjold 841

Training Curriculum in Oncology in France
N. Daly and J. P. Gerard 845

Residency Training in Radiation Oncology: Radiation Biology and Cancer Biology
E. J. Hall and J. Denekemp 847

Radiation Physics Instruction for Residents
A. R. Smith 851

Residency Training for Medical Physicists
F. M. Khan 853

● *RESIDENCY REVIEW PROCESS AND ACCREDITATION AND BOARD CERTIFICATION*

Accreditation of Radiation Oncology in the United States
J. E. Marks and J. Armbruster 857

Specific Requirements for the Accreditation of Residency Programs in Canada
B. J. Cummings 861

Accreditation Process in the United Kingdom
R. G. B. Evans 863

Higher Training and Continuing Medical Education in Radiation Oncology in the United Kingdom
R. B. G. Evans 867

International Comparison of Postgraduate Medical Education in Radiation Oncology
J. E. Marks 871

● *NEED FOR SUBSPECIALIZATION*

Policy Statement on the Accreditation of Subspecialty Programs
J. E. Marks 875

Brachytherapy as a Model for Subspecialization Within Radiation Oncology
J. F. Wilson and B. S. Hilaris 877

Pediatric Radiation Oncology—Subspecialty Training?
L. S. Constine and S. S. Donaldson 881

Subspecialization in Radiation Oncology: Impact of Stereotactic Radiosurgery
J. S. Loeffler and D. A. Larson 885

Is a Fourth Year Necessary? The Need for Subspecialization: Total Body Irradiation
B. Shank 889

The Need for Subspecialization: Intraoperative Radiation Therapy
L. R. Coia and G. E. Hanks 891

Training in Systemic Radiation Therapy
S. E. Order 895

● *FOURTH YEAR VERSUS THIRD YEAR AND MANPOWER ISSUES*

Is a Fourth Year Necessary in Radiation Oncology Training? Different Models and Funding Mechanisms
D. A. Larson and T. L. Phillips 897

The Case for a Three Year Residency Program in Radiation Oncology
T. W. Griffin 901

Results of the In-Training Examination of the American College of Radiology for Residents in Radiation Oncology
L. R. Coia, J. F. Wilson, J. P. Bresch and J. J. Diamond 903

The Role of Residents in Residency Training
C. Stevens 907

Review of the Manpower Issue in Radiation Oncology
D. F. Flynn and D. H. Hussey 909

● *CLINICAL ORIGINAL CONTRIBUTIONS*

Seminoma of the Testis: Long Term Beneficial and Deleterious Results of Radiation
G. E. Hanks, T. Peters and J. Owen 913

Impact of Adjuvant Therapy on Locally Advanced Adenocarcinoma of the Stomach
W. F. Regine and M. Mohiuddin 921

● *BIOLOGY ORIGINAL CONTRIBUTIONS*

Alteration in Myelin-Associated Proteins Following Spinal Cord Irradiation in Guinea Pigs
C. S. Chiang, K. A. Mason, H. R. Withers and W. H. McBride 929

Posttreatment Exposure to Camptothecin Enhances the Lethal Effects of X-Rays on Radioresistant Human Malignant Melanoma Cells
D. A. Boothman, M. Wang, R. A. Schea, H. L. Burrows, S. Strickfaden and J. K. Owens 939

Enhanced Induction of Tissue-Type Plasminogen Activator in Normal Human Cells Compared to Cancer-Prone Cells Following Ionizing Radiation
N. Fukunaga, H. L. Burrows, M. Meyers, R. A. Schea and D. A. Boothman 949

Pharmacokinetics of Intratumoral RK-28, a New Hypoxic Radiosensitizer
K. Sasai, Y. Shibamoto, T. Manabe, N. Baba, M. Takahashi, M. Sakaguchi and M. Abe 959

● *HYPERTHERMIA ORIGINAL CONTRIBUTIONS*

Elimination of Dose-Rate Effects by Mild Hyperthermia
Z. Wang, E. P. Armour, P. M. Corry and A. Martinez 965

● *TECHNICAL INNOVATIONS AND NOTES*

Consideration of Radiation Quality in Treatment Planning With p(66)/Be(40) Neutrons
P. J. Binns and J. H. Hough 975

● *SPECIAL FEATURE*

Recent Patterns of Growth in Radiation Therapy Facilities in the United States: A Patterns of Care Study Report
J. B. Owen, L. R. Coia and G. E. Hanks 983

● *EDITORIAL*

Subspecialization in Radiation Oncology
J. E. Marks 987

● *EPILOGUE*

Japanese System for Training Radiation Oncologists
M. Fushiki and M. Abe 989

● *CORRESPONDENCE*

Response to the Residency Match in Radiation Oncology
K. T. Bastin 991

Response to Dr. Bastin
A. S. Lichter 991

The "Bottom Line"—Response to Dr. Hanks
B. R. Prestidge, I. Kaplan, R. S. Cox, and M. A. Bagshaw 991

- *MEETINGS* 993
- *AD HOC REVIEWERS* 995
- *LIST OF CONTENTS, AUTHOR INDEX, AND SUBJECT INDEX* A1

VOLUME 24, SUPPLEMENT 1 1992

Proceedings of the
American Society for Therapeutic Radiology and Oncology
34th Annual Meeting

TABLE OF CONTENTS

Important Notice ix
Schema xiv
Map of Downtown San Diego xvi
Floor Plans of the San Diego Convention Center xviii
Officers, Committees and Awards 1
Gold Medal Award Recipients 10
Social Program 18
General Information 23
Schedule of Events 25
Agenda for ASTRO Membership Meeting (Active Members Only) 70
ASRT Educational Foundation Program 71
Society for Radiation Oncology Administrators Program 79
Association of Residents in Radiation Oncology Program 81
Commercial Exhibits, Exhibit Hall Floor Plan 83
ASTRO Refresher Course Program (Postgraduate Education) 87
ASTRO Refresher Course Descriptions 93
Keynote Addresses 117
Historical Lecture 121
Abstracts of ASTRO Proffered Papers and Posters to be Presented 123
Index of ASTRO Abstracts by Presenting Author 311